

Minutes of the HL-LHC WP2 Task 2.4

**20th (VIDYO) meeting on Wednesday 18/03/2015
(11:00-12:30, 18/3-008)**

Task 2.4 members: Alexey Burov (AB), Alessandro Drago (AD), Alessandro Gallo (AG), Andrea Mostacci (AM), Alessandro Vivoli (AV), Benoit Salvant (BS), Bruno Spataro (BrunoS), David Alesini (DA), Deepa Angal-kalinin (DAK), Elias Metral (EM), Elena Shaposhnikova (ES), Fabio Marcellini (FM), Fritz Caspers (FC), Frank Zimmermann (FZ), Gianluigi Arduini (GA), Giovanni Rumolo (GR), Hugo Alistair Day (HAD), John Jowett (JJ), Kevin Li (KL), Luigi Palumbo (LP), Mauro Migliorati (MM), Michel Martini (MM), Mikhail Zobov (MZ), Nicolas Mounet (NM), Nicolo Biancacci (NB), Oliver Boine-Frankenheim (OBF), Olga Zagorodnova (OZ), Oscar Frasciello (OF), Paul Goergen (PG), Rainer Wanzenberg (RW), Uwe Niedermayer (UN), Wolfgang Hofle (WH).

Present/Excused: AB, AD, AG, AM, AV, **BS**, BrunoS, DA, DAK, **EM**, ES, FM, FC, FZ, GA, GR, HAD, JJ, KL, LP, MM, MichelM, MZ, NM, **NB**, OBF, OZ, OF, PG, RW, UN, WH, **JuanEM**, **GianluigiA**, **ElenaS**.

1) General information (EliasM):

- Follow-up from last Task 2.4 and WP2 Task Leaders meetings:
 - ATS optics optimization such that the stability diagram during the betatron squeeze does not reduce (ongoing action: TatianaP and RiccardoDM). If a solution can be found, we could then go for LOF < 0.
 - List of actions for WP2 Task Leaders meeting: <https://espace.cern.ch/HiLumi/WP2/Wiki/Team%20Discussions.aspx>.
 - Preliminary list of talks for the future WP2 Task Leaders meetings: <https://espace.cern.ch/HiLumi/WP2/Wiki/Meetings.aspx>.
 - Concerning the e-cloud talk foreseen on 24/04/15, I confirmed (with the e-cloud team) that the current status will be presented.
 - EliasM gave a talk on follow-up of impedance actions (<https://indico.cern.ch/event/376191/contribution/2/material/slides/0.pdf>) at the last WP2 meeting => Follow-up needed:
 - Action ThibautL to provide the new mechanical design to BenoitS with the aim to have an update of the impedance by beginning of September.

- Action IliasE: send TAXS design to Elias for impedance estimates.
- Action EliasM: check with the vacuum team if the conductivity of the Copper is changed by the brazing of the Tungsten on the Copper and check whether alternative solutions can be found for the transverse weldings.
- Action EliasM: discuss with EzioT the heat load due to eddy currents during the ramp of the magnets.
- Action EliasM: update the stability limit in case Mo-coated Mo-Gr collimators are installed only in IR7 => NicoloB.
- Beam screens => EliasM confirmed that a tapering angle of 15 degrees or less should be used. Any other news?

2) Follow-up of some actions and review of all past recommendations for the impedance of Crab Cavities (EliasM):
<https://indico.cern.ch/event/381250/contribution/0/material/slides/0.pdf>

- RamaC could not join but gave us the following information :

- 1) One type of CC should be used in IP1 and the second type in IP5.
- 2) In our impedance and beam stability estimates, one should also consider that case of having only $\frac{1}{2}$ of the system.
- 3) There are still ongoing discussions about how to treat the fundamental mode (BenoitS is also discussing this with PhilippeB).

- ElenaS reminded us that in her past predictions (in 2010) for the transverse impedance limit for Crab Cavities there was an error by a factor 10 which they corrected together with AlexeyB in his subsequent recommendations in 2011.

- ElenaS commented about the importance of distributions in the stability predictions (in particular for high chroma etc.). EliasM agreed and explained that this is why this was studied in detail in the past (for instance comparing analytical formulae with the HEADTAIL tracking code) and that one should use sinusoidal modes (instead of Gaussian) ones. NicoloB will present soon his comparison between DELPHI (Vlasov solver => solving the eigenvalue problem and finding therefore the real eigen vectors without any assumption) and analytical predictions assuming either Gaussian or sinusoidal modes.

3) HL-LHC RF beam parameters at injection (JuanE):
<https://indico.cern.ch/event/381250/contribution/2/material/slides/1.pdf>

- JuanEM mentioned in particular that the gamma transition for the ATS optics is 53.789 (for the nominal LHC it is 55.68). GianluigiA noted after the meeting that in collision with ATS the gamma transition will be 53.70. For more details or value for intermediate optics (e.g. pre squeeze) we can find all the information at: <http://lhc-optics.web.cern.ch/lhc-optics/www/hllhc11/>.

- Reminder: there are 3 ways to compute bunch length :

- 4 sigma Gaussian => What they use for MDs.

- 4 rms => Not used.

- FWHM => As measured in the LHC and SPS in operation.

- What should we use ? => Gaussian fit according to JuanEM and ElenaS.

4) Next meeting

- The next (21th) VIDYO meeting will take place on Wednesday 25/ 03/2015 from 11:00 to 12:30 in the room 6/R-018 for the CERN people. The agenda is

1) General information and AOB (EliasM)

2) Impedance and beam stability studies (NicoloB and KevinL)

3) Follow-up (finalization) of the operational scenarios (TatianaP)

Minutes by EliasM, 25/03/2015.